The Knapheide Mfg. Co. ▪ 436 South Sixth Street ▪ Box C 140 ▪ Quincy, Illinois 62306-2140
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May 5, 1995

MR. RUBEN MCCULLERS
ENVIRONMENTAL SCIENTIST
U.S. EPA, REGION VII
WSTM/RCRA/RCOM
726 MINNESOTA AVENUE
KANSAS CITY KS 66101

RE: First Modification to Consolidated Consent Agreement and Consent Order
Dated: March 8, 1995

Pursuant to paragraph 2 of the First Modification Agreement, The Knapheide Mfg. Co. hereby submits descriptions of the following S.E.P.'s which the EPA considers potentially available for offset under Section III.E. of the Consent Order.

a. Examine the environmental impact of the flood on the West Quincy facility, remove the non-waste containing tanks and remediate any damage caused by releases from these tanks during the flood.

b. Activities performed by the facility prior to the flood to prevent or minimize the environmental damage from the flood to the West Quincy area.

c. Install and use waste minimization or pollution prevention equipment in the existing facility in Quincy.

d. Examine technologies previously not used by The Knapheide Mfg. Co. for use in the permanent facility to be located in the Quincy, Illinois area.

If you have any questions on the above S.E.P.'s or need additional information, please advise.

Sincerely,

THE KNAPHEIDE MFG. CO.

Gerry Korb

Gerry Korb
Vice President Operations

GWK:dd

Enclosures

cc: Sandra Oberkfell, Rudnick & Wolfe

Date: April 28, 1995

Subject: EPA SUPPLEMENTAL ENVIRONMENTAL PROJECT

Project: EXAMINE THE ENVIRONMENTAL IMPACT OF THE FLOOD ON THE WEST QUINCY, MISSOURI FACILITY AND DISPOSE OF THE ABOVE GROUND TANKS AND WOOD TREATMENT BUILDING

Category: POLLUTION PREVENTION

Prior to the Great Flood of 1993, The Knapheide Mfg. Co. used seven (7) above ground tanks for storage of chemicals and fuel oil for use in its West Quincy, Mo. facilities. These tanks were connected to furnaces and other equipment by above and underground piping.

Before the water inundated the West Quincy, Mo. area, all seven tanks were capped-off and sealed to prevent leaks and spills should the area become flooded. The wood treatment was pumped from the treatment pit back into the storage tank to prevent contamination from the flood waters.

Following the flood on July 16, 1993, several actions were taken to determine the environmental impact:

- Boat trips were made to survey tanks, tank integrity and other potential problems.
- Tanks which had broken loose of their frames were secured by cables to prevent them from floating away, colliding with other objects, and releasing the contents into the flood waters.
- After the floodwaters had receded Schreiber, Grana & Yonley, Inc., environmental consultants, performed a review of the property along with Harold Huggins to assess any environmental damage.
- Buildings and grounds were cleaned of the flood residue and debris so the extent of the damage and contamination could be assessed.
- The wood treatment building was damaged beyond repair when the flood waters floated the partially empty storage tank off the frame and through the roof.

This SEP includes the post-flood investigation and cleanup work already performed plus the cost of disposing of the wood treatment building and the following fuel oil and solvent tanks previously used. The pipes will be thoroughly emptied and capped-off in place.

TANK CONTENTS	SIZE (Gals)
Woodtreatment MB	9,700
Xylene	1,000
Barton D100	1,000
# 2 Heating Oil	1,000
# 2 Heating Oil	12,000
# 2 Heating Oil	9,700
# 2 Heating Oil	4,000

COST ESTIMATE:

1. Cleanup of the buildings and grounds.	$146,631	
2. Disposal of the tanks, tank contents and clean and close piping.	$ 14,000	E
3. Dismantling and disposing of the damaged wood treatment building.	$ 2,000	E

SCHEDULE:

- Events 1 and 2 above were completed late in 1993 and early 1994, following the receding of the flood waters.
- The disposal of the tank contents, cleaning of the tanks and disposal of the tanks will be done in May and June, 1995. Schrieber, Grana and Yonley, Inc. will coordinate.
- The dismantling and disposal of the wood treatment building, severely damaged by the flood will be done in conjunction with the testing and removal of the equipment previously used for treating wood with fungicides and pentachloraphenol. This SEP includes the building removal only. The tank content disposal and equipment testing, cleaning and removal are covered on another project. The building should be removed in June, 1995. Schrieber, Grana & Yonley will coordinate the work.

ENVIRONMENTAL BENEFITS:

The Great Flood of 1993 caused considerable damage to the property in West Quincy, Missouri. However, due to good up front planning and foresight, potential environmental problems created by releases of hazardous materials from tanks, pits and drums were

avoided. Studies performed after the flood showed the West Quincy area environmental conditions to be relatively unchanged from the conditions preceding the flood.

The flood waters did leave heavy deposits of mud and debris which had to be removed and disposed of. The waters also damaged every building, requiring repair/replacement of all walls and floated five of the seven fuel/chemical tanks off their frames/foundations.

By removing the tanks, switching the heating source to natural gas and eliminating the processes supported by the solvent tanks, the probability of a substantial spill or leak causing pollution in this area is all but eliminated.

All of the tanks listed are above ground. The piping is underground. The cost of the project will include the removal and disposal of the remaining solvent and heating oil in addition to the proper disposal of the tanks. Disposal of the wood treatment material is not covered in this SEP. The piping will be inspected, drained and capped off. Any leaks from the piping will be considered part of the oil spill project included in the MDNR work.

The total cost incurred to date plus the estimated additional costs for this SEP is $194,631. This SEP should be considered a significant pollution prevention effort.

Date: April 13, 1995

Subject: EPA SUPPLEMENTAL ENVIRONMENTAL PROJECT

Project: FIGHTING THE GREAT FLOOD OF 1993

Category: POLLUTION PREVENTION

Prior to the Great Flood of 1993, The Knapheide Mfg. Co. Inc. operated an assembly plant and warehousing and shipping operation in West Quincy, Missouri. West Quincy is contained in the Fabius levee district, a 15,000 acre area protected by a levee system designed and built by the Corps of Engineers.

Knapheide began monitoring and preparing for the high water levels as early as March. However, the efforts to actually fight the high water began July 1 when most of the office and shop employees were used to build a levee accross the east bound route of highway 24 to prevent the river from crossing the road thus flooding the Fabius levee district. The road closure started at 7:00 a.m. By 2:00 p.m. the water was 8 to 10 inches deep on top of the road next to the "closure". From that point on, the level of effort intensified to where all 290 employees worked night and day to lay sandbags and reinforce the levees.

The Knapheide Mfg. Co. was the largest employer in the levee district by tenfold and without its coordination, equipment and manpower it is doubtful the water would have been held back for a fraction of the 16 days, thus allowing individuals and companies to remove their materials and equipment.

Knapheide began an orderly shutdown and removal of property from its site once the river was stabilized at its high level. Hazardous wastes, paints and solvents were removed first, followed by production materials and equipment.

Knapheide spent approximately $28,600 actually removing materials and equipment from the West Quincy facility, a small portion of the total cost of fighting the flood.

The Fabius Levee District is made up of several farms, gas stations and local businesses in addition to The Knapheide Mfg. Co. The quick action on July 1 allowed these entities time to implement orderly shutdowns of their operations, salvaging equipment and materials. The action gave them time to remove oil, gasoline, herbicides, pesticides and other chemicals from the threatened area thus preventing these chemicals from being washed into the Mississippi River.

It was a "sound business practice" for Knapheide to protect its property from flooding, at least until the contents were removed from the buildings thus assuring a more rapid recovery after the flood. However, the SEP policy states that pollution prevention projects are exempted from the rule prohibiting acceptance of projects that are sound business practices. Most of the effort made by Knapheide prior to the flood went toward preventing flooding and subsequent pollution. Without the company's efforts, very little of

the potential pollutants would have been removed from the flooded area or secured to prevent spillage.

Knapheide spent $538,377 fighting the flood. The costs included labor for sandbagging, materials and equipment usage. $28,600 is estimated as the cost to remove hazardous materials, paints, machinery, equipment and inventory from the plant. The balance of $509,777 was spent on prevention and protection. FEMA reimbursed Knapheide $254,282 or approximately 50% of the cost of the effort. The remaining amount, $255,495 ($538,377-$28,600-$254,282) should be considered as the amount spent on a very significant pollution prevention project.

The company spent nearly $3 million since the flood to set-up temporary operations so it could remain in business until a new plant is constructed.

Date: April 15, 1995

Subj: EPA SUPPLEMENTAL ENVIRONMENTAL PROJECT

Project: PAINT USAGE AND VOC REDUCTION IN TEMPORARY PLANT

Category: WASTE MINIMIZATION AND POLLUTION PREVENTION

When The Knapheide Manufacturing Co. vacated it's West Quincy, Missouri assembly plants due to the Great Flood of 1993, it quickly relocated into an old vacant manufacturing plant in Quincy, Illinois. West Quincy is located in an area that is unregulated for VOC emissions. The paints used in the West Quincy facility were all low in solids content with VOC levels from 6.0 - 6.5 lbs/gal. In Quincy, Illinois, the IEPA regulates VOC levels at 3.5 lbs/gal for medium to high volume users. The Knapheide Manufacturing Co. applied for and received an Air Permit Varience allowing the company to use the low solid coatings in the temporary facility with the understanding that a new permanent facility would be constructed. The new facility would have to meet all environmental regulations including the 3.5 lbs/gal VOC requiremens.

The temporary facility was equipped with processes similar to those used in West Quincy including the low solids / high VOC paints. Bake ovens were installed in the Side Assembly and Tool Box paint lines to accelerate the paint curing processes. The ovens are infra-red and built by Infra-Red Technologies. The ovens have been independently tested and proven to destroy certain types of VOC's that come in contact with the platinum plates used to generate the heat. See attached discussion on the VOC destruction process.

In April, 1994 the Side Assembly prime paint was switched from Sikkens Washprime Red at 10.5% solids to Sikkens L. V. Grey Epoxy Prime at 48.8% solids. The change was made to reduce VOC emissions, eliminate the chrome in the paint and reduce the quantity of waste filters. The change to the L. V. product was possible because the bake oven could reach temperatures sufficient to cure the paint.

The paint used for top coating tool boxes was change from Sikkens Metaflex Black at 26.3% solids to Sikkens Autocoat L. V. Black, 52.7% solids in June, 1994 to further reduce VOC emissions. Again the change was possible because the Infra-Red ovens were in place to cure the paint.

VOC emissions were dramatically reduced in August, 1994 when a new double wide bake oven was installed to service the Standard Utility Body and Custom Utility Body lines. The oven allowed the changeover from Sikkens Washprime Red and Washprime Grey paints used on the exterior and interior surfaces of all utility bodies to the Sikkens L. V. Grey Epoxy Prime paint. The L. V. paint is 48.8% solids versus 10.5% for the Washprime. Furthermore, the L. V. paint is completely chrome free and generates less waste filters.

The Knapheide Manufacturing Co. spent $101,966 installing the (2) Infra-Red ovens in the Side Assembly and Tool Box departments. The cost of the Utility Body bake oven was $107,709. The results of the change in paints are dramatic: (Based on Jan & Feb 1994 vs 1995)

- VOC emissions dropped from 79,200 lbs to 46,092 lbs. (46.1%)
- The business levels increased from 46,284 hours of output to 52,120 hours. (12.6%)
- VOC emissions per output hour dropped from 1.711 lbs/hr of total output to .884 lbs/hr. (48.3%)

With the investment of $209,675 in bake ovens and miscellaneous equipment the Knapheide Manufacturing Co. was able to reduce VOC emissions nearly 50% without considering the VOC destroying characteristics of the Infra-Red ovens. The reduction was not required since the "Varience" exempted the company from meeting the current VOC regulation levels. The investment in ovens is a significant waste minimization and pollution reduction project.

INFRA-RED BAKE OVENS

The ovens contain several infra-red panels which are coated with platinum. At start-up, the panels are heated with electricity to 225° F. When 225° F is reached, natural gas is introduced to the panel. The heat from the panel, oxygen from the air entering the front of the panel, and the platinum (catalyst) cause the natural gas to undergo a chemical change releasing carbon dioxide, water vapor, and heat. Sufficient heat is generated by the reaction to keep the panels at 500-600° F. The formula for the change is:

$$C_4 + 20_2 = CO_2 + 2\,H_20 + HEAT$$

Infra-Red Technology's description is attached.

The process continues until the natural gas is removed. For every cubic foot of natural gas (or fuel) brought in contact with the head, (10) cubic feet of air is consumed through the head to support the catalatic reaction. Any V.O.C.'s in the air will also be consumed like the natural gas as follows:

BENZENE: $C_6\,H_6$

$$2\,C_6\,H_6 + 15\,O_2 = 12\,CO_2 + 6\,H_2O + HEAT$$

XYLENE: $C_6\,H_4\,(C_3OH)_2$

$$6_6H_4{\bullet}(C_30H)_2 + 10\,O_2 = 8CO_2 + 6\,H_20 + HEAT$$

Thus, the ovens reduce pollution by destroying a percentage of the V.O.C.'s released during the curing process.

Infra-Red Technologies, the manufacturer of the ovens, had independent tests run at the Ashland Chemical Lab in Ashland, Ohio, and found that up to 94.8% of the V.O.C.'s introduced to the platinum heads were consumed and converted to carbon dioxide and water. Infra-Red Technologies has applied for a patent for the process.

INFRA-RED TECHNOLOGIES, INC.

GAS AND ELECTRIC INFRARED HEATING EQUIPMENT

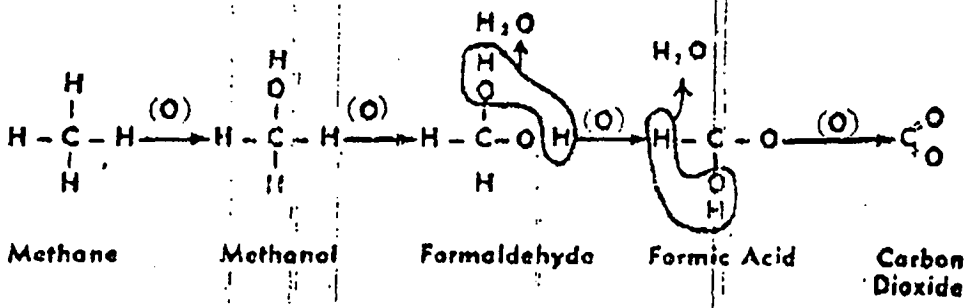
Infra-Red Technologies, Inc.
4008 East Ninth Street
Kansas City, Missouri 64124

Telephone (816) 241-4433
Fax (816) 483-5151

The complete combustion of methane gas is—

$$CH_4 + 2O_2 - - - \rightarrow CO_2 + 2H_2O$$

The complete oxidation of CH_4 is shown in the following formula.



Once the oxidation starts, the action completes itself and there is very little chance, if any, that the process will stop short of completion.

Date: April 14, 1995

Subject: EPA SUPPLEMENTAL ENVIRONMENTAL PROJECT

Project: PAINT TECHNOLOGY INVESTIGATION/CONSULTING

Catagory: POLLUTION PREVENTION/POLLUTION REDUCTION

Prior to the Great Flood of '93, The Knapheide Mfg. Co. assembled and painted its products in West Quincy, Missouri, an area unregulated for VOC emissions. Temporarily, the company is manufacturing in a leased facility in Quincy, Illinois. VOC levels are regulated at 3.5 lbs./gal. in Illinois. However, Knapheide has an air permit variance which allows the company to exceed the 3.5 lbs./gal. VOC limit until permanent facilities are constructed.

The Knapheide Manufacturing Co. purchased land and will build its new assembly plant and company headquarters in Quincy, Illinois. Because of the significance of the investment and the desire to remain forever in the Quincy area, the company is committed to studying the best available technologies, and implementing a technology that will meet or exceed the regulation requirements for several years. Technologies being considered include electrocoating, powder coating, water based coatings and high solids spray coatings. The study is necessary to determine the technologies most applicable to our products and most friendly to the environment.

This study falls within the guidelines of the SEP policies for pollution prevention/pollution reduction projects.

Knapheide hired a paint consultant to help guide the project. The consultant conducted an in-house paint seminar, suggested technologies to consider, and made industry contacts to help set-up paint tests. Subsequently, the company has made several trips to visit paint equipment users and manufacturers. Company engineers have attended finishing seminars and have run paint trials on company products.

The company has spent $40,058 to date on consulting fees, travel expenses and testing. An additional $5,000 is estimated to be spent in the next 2 months before the final equipment decisions are made. The end result will be the selection of the most environmently friendly processes applicable to our products. The entire study will cost $45,058 and will probably include the recommendation of electrocoating equipment for prime painting and powder and high solids spray for top coating. A summary of the costs to date is attached along with an estimate of the future study costs.

PAINT TECHNOLOGY INVESTIGATION / EVALUATION

DATE	EVENT	COSTS	
1994			
JAN 27 & 28	PAINT SEMINAR		
	BOB GREAR, SME - INSTRUCTOR	$ 5,210	
	REFRESHMENTS & LUNCHES	357	
		78	
	(18) ATTENDEES @ $40K EA * 2 DAYS	5,760	11,405
FEB 11 & 12	PAINT CONSULTING		
	BOB GREAR - FEES & TRAVEL	1,382	
	LUNCH	9	1,391
MAR 14 & 15	PAINT CONSULTING		
	BOB GREAR - FEES & TRAVEL	1,247	
	LUNCH, MOTEL	124	1,371
APR 25 & 26	PAINT CONSULTING - BOB GREAR &		
	KENNETH LITTEREST -FEES & TRAVEL	1,332	
	LUNCH, MOTEL	276	1,608
APR 25 & 26	POWDER PAINT SEMINAR - (JIM BARNETT)		
	TRAVEL & LODGING	391	
	SEMINAR COST	235	626
APR 28 & 29	E-COAT TNG @ BASF		
	(JIM BARNETT, HAROLD HUGGINS, KEITH NORRIS, JON WREN, JOHN BAIRD, JOHN EVANS)		
	LODGING & MEALS	566	
	TRAVEL (3.8 HRS @ 738/HR)	2,804	3,370
MAY 15 - 20	PAINT CONSULTING - KENNETH LITTEREST		
	FEES & TRAVEL	895	
	MOTEL	294	1,189
JUN 27	TO CHRYSLER TEST LAB IN DETROIT, ANDERSON MFG, DUKES INDUSTRIES & DEFIANCE METAL PRODUCTS (JIM BARNETT, HAROLD HUGGINS, JOHN EVANS, DICK WHICKER, GERRY KORB)		
	TRAVEL (4.4 HRS @ 738/HR)		3,247

DATE	EVENT	COSTS	
JUN 28	TO WINNEBAGO INDUSTRIES & LENNOX (JIM BARNETT, HAROLD HUGGINS, KNAP, DICK WHICKER, GERRY KORB)		
	TRAVEL (2.9 HRS @ 738/HR)		2,140
JUL 27 - 29	SEMINAR - PPG COATINGS, PITTSBURGH (DICK WHICKER & JIM BARNETT)		
	TRAVEL	664	
	MEALS & LODGING	538	1,202
AUG 16	TO COOPER POWER SYSTEMS & STEELTECH, MILW (JIM BARNETT, HAROLD HUGGINS, DICK WHICHER, BILL GREVING, GERRY KORB)		
	TRAVEL (2.0 HR @ 738/ HR)		1,476
NOV 21	TO MORTON POWDER & WAGNER RECLAIM - (JIM BARNETT)		
	TRAVEL	60	
	LODGING	186	246
1995			
JAN 25	E-COAT PARTS @ STEELTECH (JIM BARNETT, DICK WHICHER, JOHN BAIRD, GARY MOHR, BILL GREVING)		
	TRAVEL	332	
	TRAVEL (2.5 HRS @ 738/ HR)	1,845	2,177
JAN 26	REVIEW E-COAT PARTS @ STEELTECH (JIM BARNETT) CHIC TO MILW		
	TRAVEL (1.5 HR @ 738)		1,107
FEB 21 - 23	POWDER TEST @ NORDSON (GARY MOHR & JIM BARNETT)		
	TRAVEL	756	
	LODGING	384	
	PARTS SHIPPING	696	1,836

DATE	EVENT	COSTS	
MAR 16	TO TTX, STERGEON BAY, WI (JIM BARNETT, HAROLD HUGGINS, GERRY KORB)		
	TRAVEL	1,794	
	LODGING	135	1,929
MAR 30	TO JOHN DEERE, HORICON, WI & GEO KOCH & SONS, EVANSVILLE, IN (JIM BARNETT, GARY MOHR, GERRY KORB)		
	TRAVEL (5 HR @ 738)		3,690
APR 18	TO ST LOUIS W/ NORDSON TO LOOK AT POWDER EQ (GARY MOHR)		
	TRAVEL & MEALS		47
FUTURE	FURTHER EVALUATION		5,000
	TOTAL COST		$ 45,058